

HAPPY 1050 ENHANCEMENT
WARP SPEED SOFTWARE
REV 6 INSTRUCTIONS

FOR USE WITH THE HAPPY 1050 ENHANCEMENT
INSTALLED IN ATARI 1050 DISK DRIVES
WITH ATARI PERSONAL COMPUTERS

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READ THIS INSTRUCTION MANUAL COMPLETELY
BEFORE USING A DISK DRIVE ENHANCED
WITH THE HAPPY 1050 ENHANCEMENT

note: ATARI is a trademark of Atari Inc.

TABLE OF CONTENTS

item	page
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RULES FOR DISK DRIVE USAGE	1
SLOW MODE, WHEN TO USE IT	1
WARP SPEED SOFTWARE MENU PROGRAM	2
MENU PROGRAM INFORMATION DISPLAYED	3
LOADING WARP SPEED SOFTWARE	4
SLOW IT DOWN, WHAT IT DOES, HOW TO USE IT	4
ENABELING AND USING THE TRACER	5
DISPLAY TRACE DATA	6
DIAGNOSTIC AND RPM MEASUREMENT	7
HAPPY BACKUP & HAPPY COMPACTOR common features	8
SPECIAL RECOVERY MENU - X and R keys	9
SPECIAL RECOVERY MENU - D and T keys	10
SPECIAL RECOVERY MENU - F + - * / keys	11
SPECIAL RECOVERY MENU - SKEW ALIGNMENT	12
OTHER COMMON FEATURES of HBP, HCF & MDP	13
SPECIFIC PURPOSE of HBP & MDP	13
DISK COPYING WITH HBP & MDP	13
HAPPY COMPACTOR purpose, function, names, init	14
HAPPY COMPACTOR - operating the COMPACTOR	15

ADDENDUM and ANNOUNCEMENTS

This instruction manual is for use with the interim 6.0 revision software. All those that purchase the 1050 ENHANCEMENT may receive the revision 7.0 software and instructions at no additional charge by sending in the warranty card. Boot your software disk, if it says revision 7.0 or higher these are the wrong instructions.

Due to last minute problems in compatibility with 810 ENHANCEMENTS this interim revision lets the 1050 ENHANCEMENT purchaser use many of ENHANCEMENT's features until the final intended software arrives. Revision 6.0 will work only with ENHANCED 1050 disk drives, not with 810 disk drives. Revision 6.0 does not include the SECTOR COPIER, WARP SPEED DOS, or MULTI DRIVE programs. The backup capability of revision 6.0 is equivalent to 810 software revision 5.1.

Revision 7.0 will include all features not in 6.0 and will allow ENHANCED 810s and ENHANCED 1050s to work together. It will also include backup capability for several newer copy protection methods now being used, which 6.0 does not handle. Rev 7.0 shipments for 1050 ENHANCEMENT owners will begin before Christmas.

You may notice that the HAPPY BACKUP and COMPACTOR of revision 6.0 operate at higher speed than previous versions for the 810. In order to have the 810 operate with the 1050 at the higher speed a plug in hardware update will be part of the 810 revision 7.0, the 1050 will not need a hardware update. If you receive this revision 6.0 and are a registered 810 ENHANCEMENT owner you are entitled to the 810 HARDWARE update at no charge. More information on this will be sent to all registered 810 ENHANCEMENT owners.

Several features of this revision 6.0 are not in these instructions. Of special interest is the programming options. Note that the "CHANGE DRIVE NUMBER" feature will not work with HAPPY software since the drive is usually initialized by the HAPPY software. The "SET UNHAPPY MODE" is equivalent to "SLOW MODE" in these instructions. The "INIT DRIVE" resets the 1050 disk drive to the default power up conditions, you cannot do this if you have "SET UNHAPPY MODE".

The "SET TO U.S. EMU" option allows the 1050 to be used with SPARTADOS (trademark ICD, Inc.). The 1050 HAPPY in U.S. EMU mode provides the fastest reading and writing available. Write with verify is always enabled, and no special formatting is needed. The HAPPY 1050 does not need the U.S. sector skew.

The "SET TO FAST WRITE" option allows the user to have super fast write with verify, while using any software. In this mode write without verify commands are automatically converted to write with verify, and the FAST WRITE does write with verify faster than a standard disk drive and software does write without verify. When using FAST WRITE do not open the disk drive door while the disk drive busy light is on. If you notice that the busy light is blinking on and off several times per second then you have a write/verify error. The power up condition is that FAST WRITE is not enabled. This was done since many users have to get over the habit of removing disks while the busy light is on, and that may cause an error condition with FAST WRITE enabled.

WARP SPEED DOS XL

HAPPY COMPUTERS and OPTIMIZED SYSTEMS SOFTWARE have reached an agreement. HAPPY COMPUTERS will make available WARP SPEED DOS XL, which allows top speed of ENHANCED 810 and 1050 disk drive operation, and may be used with non-HAPPY drives too. The "UNDER CARTRIDGE" and "UNDER OS ROM" versions will be included. WARP SPEED DOS XL provides the most compatible double density support and best memory utilization, and comes with the 152 page DOS XL manual. The price is \$24.95 for registered HAPPY ENHANCEMENT owners only. Add \$5.00 for ANY shipment outside the continental United States. WARP SPEED DOS XL will be available simultaneously with rev 7.0.

HAPPY 1050 CONTROLLER

The HAPPY 1050 CONTROLLER allows the user to turn on FAST WRITE and enable slow reading and writing without special software using a two position switch. There is a three position switch which allows control of the write protect electronics. The disk drive may be operated such that writing is not allowed, always allowed, or dependent on the presence of the disk notch (normal mode) depending on the position of the switch. The write protect or enable may also be controlled with software commands from the personal computer which brings up a question... does the switch or the software have priority? Priority is determined by the setting of a DIP switch on the CONTROLLER board during installation. The DIP switch may also be set to prevent writing unless the special software command is executed, handy if you have young people using your disks. There is also a lamp which glows when writing is enabled. The electrical connections for the CONTROLLER board are all plug in. To get the switches and lamp through the front panel it is necessary to drill 3 holes of 1/4 inch each. A stick on drilling template is provided to assist in hole placement. The CONTROLLER is \$49.95. Add \$5.00 for ANY shipment outside the continental United States.

RULES FOR DISK DRIVE USAGE - REMINDERS

Never insert or remove disks when the disk drive is active (when the top red light is on).

Never turn the disk drive on or off while a diskette is inserted.

Always place a write protect tab on a disk, remove this only when you intend to write on the disk.

NEW RULES FOR THE HAPPY 810 ENHANCEMENT

If you have an add on write protect disable switch this switch must have a position where the normal write protect detection mechanism is enabled, and the switch should be left in that position at all times on your ENHANCED drive, except when you wish to write on the backside or on a write protected disk, for the ENHANCEMENT to work correctly and pass diagnostics.

When first powered on the ENHANCED disk drive is in the buffered reading "FAST MODE". DOS formatted disks are always safe to use in the "FAST MODE".

Purchased software items on diskettes should always be protected with a write protect tab. Some copyguarded disks may not work with the "FAST MODE". In fact some copyguarded disk programs may misinterpret "FAST MODE" as a pirated copy and may attempt to erase your disk or backup.

Before trying to read in a purchased software item for the first time on an ENHANCED disk drive, be sure there is a write protect tab on it. Some disks may not work correctly with a write protect tab. Always backup these disks before removing the write protect tab, or run SLOW IT DOWN.

The HAPPY 810 ENHANCEMENT does not erase disks, but a purchased software item which misinterprets "FAST MODE" as a pirated copy might!

SLOW IT DOWN - when to enable SLOW MODE

RPM PROGRAM

Use SLOW IT DOWN when you are going to use an RPM program on your disk drive. Without running SLOW IT DOWN, a standard RPM program will not function correctly, and will show a very fast RPM. This is not correct, the 810 ENHANCEMENT does NOT cause the disk to turn faster. If you run the SLOW IT DOWN program, these standard RPM programs will now function correctly.

European users will find that most RPM programs will not read correctly with the PAL 50 Hz television system. Instead of showing 288 RPM, they show $288 \times 60/50 = 346$ RPM, even though the RPM is really 288. Sixty Hz is the American NTSC vertical retrace rate, and 50 Hz is the European PAL vertical retrace rate, which most programs rely on for RPM measurements.

For this purpose HAPPY COMPUTING provides an easy to use and accurate RPM program for use with an ENHANCED disk drive. This program does not require running SLOW IT DOWN, and will read correctly on both 50 and 60 Hertz systems.

COPYGUARDED DISKS

Use slow it down to run copyguarded disks which will not work correctly in the "FAST MODE". Note that the HAPPY BACKUP PROGRAMS and the COMPACTOR PROGRAM have a feature to force backup copies to be produced in a way such that they will automatically run in the "SLOW MODE", without running SLOW IT DOWN. See the SPECIAL RECOVERY MENU instructions.

WARP SPEED SOFTWARE MENU PROGRAM

PURPOSE

The WARP SPEED SOFTWARE MENU PROGRAM provides access to most other programs on the WARP SPEED SOFTWARE disk. The menu program is also used to enable the tracer, display tracer information, enable the SLOW MODE of operation on ENHANCED disk drives, and display information about the current operating environment in the personal computer. The menu program is always the first program loaded into the personal computer when the WARP SPEED SOFTWARE disk is first booted. WARP SPEED DOS is the only function which is not accessed from the menu program. WARP SPEED DOS is accessed through other means explained in the documentation on the WARP SPEED DOS program.

FUNCTION

The menu program is the self booting portion of the WARP SPEED software disk. When first booted the menu program unlocks and recovers the tracer information from any ENHANCED disk drive on which the tracer was previously enabled. The menu program is always booted in drive one in the system, drive one may be any ATARI serial bus, single density compatible disk drive. Drive one does not have to be an ENHANCED drive. The menu program allows the user to select a function by pressing the number on the personal computer keyboard that corresponds to the number of that function displayed next to the name of that function on the video screen.

BUILT IN FUNCTIONS

Once the menu program is booted, and the menu displayed, access is immediately provided to those functions which are built into the menu program without reaccessing the WARP SPEED SOFTWARE DISK. These include the following.

- 0) WARP SPEED DOS (message printed only)
- 1) SLOW IT DOWN
- 7) ENABLE TRACER
- 8) DISPLAY TRACER INFORMATION

A description of each of the above built in functions is provided in this section on the menu program.

FUNCTIONS NOT BUILT INTO THE MENU PROGRAM

Other functions available through the WARP SPEED SOFTWARE menu require accessing a disk drive and loading that program into memory. The menu program will automatically provide the setup needed by the desired program, load that program into the personal computer memory, and transfer control to that program. Once the requested program begins to load into memory it is not possible to return to the menu program without rebooting the personal computer from the WARP SPEED SOFTWARE DISK. These functions which require accessing a disk drive to load include the following:

- 2) DIAGNOSTIC
- 3) SECTOR COPIER
- 4) HAPPY BACKUP PROGRAM
- 5) HAPPY COMPACTOR PROGRAM
- 6) MULTI DRIVE PROGRAM

A separate section describing the purpose, function, and usage of each of these programs is included.

MENU PROGRAM - INFORMATION DISPLAYED

The menu of the self booting menu program displays information about the environment in which the WARP SPEED SOFTWARE is operating. This information includes the personal computer memory size, whether or not there is an enabled AXLON RAMDISK inserted into the personal computer, which disk drives connected to the personal computer are enabled as HAPPY ENHANCED drives, and whether or not the tracer information has been recovered from the most recent disk execution trace. This information is of importance to the WARP SPEED SOFTWARE user. The meaning of these items is discussed below.

PERSONAL COMPUTER MEMORY SIZE

The personal computer memory size displayed by the menu program is the total amount of contiguous random access memory available for holding programs and data. The amount of memory is usually 16K, 24K, 32K, 40K, 48K, or 52K. All of the WARP SPEED SOFTWARE programs require 16K memory minimum except WARP SPEED DOS which requires 24K minimum.

The WARP SPEED SOFTWARE uses all available memory after the space occupied by each program for storing the disk data being copied. With one disk drive it is especially desirable to have as much personal computer memory as possible available to the WARP SPEED SOFTWARE programs, so that fewer insertions of source and destination disk are needed.

Certain plug in or switch selected options in the personal computer cause less contiguous memory to be available. For example any cartridge plugged in may cause 8K, 16K, or even 20K less memory to be available in a 48K or 52K computer. In the newer ATARI XL computers which have the built in BASIC and 48K memory, if you do not hold the OPTION button down while turning on the power to the personal computer to boot the WARP SPEED SOFTWARE menu program you will have 8K less memory available. Paying attention to the personal computer memory size will alert you to the need to select switch options, plug in memory boards and or remove cartridges that may be temporarily stealing memory.

RAMDISK YES or NO

If you have a bank selected RAMDISK (trademark of AXLON) plugged in and enabled in your personal computer the menu program will display RAMDISK = YES, otherwise the menu program will display RAMDISK = NO. The RAMDISK is especially important for use of the SECTOR COPIER program where it is fully supported. Looking at the status of your RAMDISK (if you have one) on the menu display will tell you whether or not you have the select switch in the correct position.

HAPPY DRIVES - WHICH DRIVE NUMBERS

The menu program displays the drive numbers of all ENHANCED disk drives which are plugged into the personal computer and turned on. ENHANCED disk drives which have been placed in the "SLOW" mode do not appear to the system as a HAPPY drive. If you turn off or on an ENHANCED disk drive, re-enable the fast mode on a previously "SLOWED DOWN" ENHANCED disk drive, or change the drive select switches on an ENHANCED drive, press reset so the menu program will report the new HAPPY drive numbers.

Most of the programs on the WARP SPEED SOFTWARE disk will only work with HAPPY ENHANCED disk drives that are recognized by the menu program. Always press reset after changing the ENHANCED drive configuration once the menu program is loaded. Having the menu program recognize the proper HAPPY drive configuration allows the WARP SPEED SOFTWARE to select the source and destination drives.

HAVE TRACER INFORMATION - YES or NO

This display tells you whether or not the TRACER had been enabled and the execution trace "TRACKS USED" information has been recovered upon the load of the WARP SPEED MENU PROGRAM. See the section on ENABLE TRACER, COPY PER TRACER, and COMPACT program for further information.

LOADING THE WARP SPEED SOFTWARE

The HAPPY COMPUTERS WARP SPEED SOFTWARE programs disk is a self booting disk that is booted in disk drive 1. Drive 1 may be any ATARI serial bus connected, single density compatible disk drive. Boot this disk as with any other self booting disk. It is suggested that you remove any plug in cartridges before booting, and on the newer XL computers which have built in BASIC you should hold the OPTION button down while turning on the personal computer so that all of the 48K memory will be available. Do NOT use the ATARI TRANSLATOR with the WARP SPEED SOFTWARE.

Once the WARP SPEED SOFTWARE disk is booted the menu of functions is displayed, examine the information at the bottom of the screen as per the previous page before proceeding to select a function. Press the number corresponding to the function you wish to execute as displayed on the menu. You may press the number of the function you want before the menu program finishes booting if you remember that number, see the SLOW IT DOWN example below.

SLOW IT DOWN WHAT IT DOES

SLOW IT DOWN reprograms your ENHANCED disk drive in such a fashion as to restore the original unenhanced slower reading function. In addition SLOW IT DOWN locks out the programability of your enhanced disk drive which makes it appear to the personal computer as a standard unenhanced 810 disk drive.

Once SLOW IT DOWN is executed it prevents mischievous software suppliers from tampering with your enhanced 810's programability, and from detecting the presence of the 810 ENHANCEMENT, which some software suppliers may object to due to its backup capability.

Once SLOW IT DOWN has been executed, the only way possible to restore the "FAST MODE" and drive programability is to turn the disk drive off, and then on again. DO NOT TURN THE DISK DRIVE OFF AND ON WITH A DISK INSERTED!

SLOW IT DOWN - PLACE AN ENHANCED DRIVE IN THE SLOW MODE

Press 1 on the menu to select SLOW IT DOWN, the slow it down display screen will appear, and the current HAPPY ENHANCED disk drives will be displayed. If there are no HAPPY drives, SLOW IT DOWN cannot be executed. Press the drive number of the HAPPY drive you wish to place in the SLOW MODE. If drive numbers are pressed which are not HAPPY ENHANCED drives, there is no effect.

If you press return and return to the menu you will notice that the drive you just slowed down does not appear in the list of HAPPY DRIVES. That drive will stay in the SLOW MODE until that disk drive is turned off and then on again, without regard to what the personal computer does. Once SLOW MODE is enabled you may immediately proceed to use the disk drive and computer as needed in the SLOW MODE; it is not necessary that you return to the WARP SPEED SOFTWARE menu.

Previous revisions of the HAPPY BACKUP PROGRAM self booting disk had the SLOW IT DOWN program to place only drive 1 in the slow mode on the back side of the disk as a self booting program. You may continue to use this program to place drive 1 in the slow mode if you have it. To quickly place drive 1 in the slow mode with the WARP SPEED SOFTWARE disk just hold the "1" button down on the keyboard while booting the menu program. This will effectively select "1" from the menu which is SLOW IT DOWN, and then select drive 1 for slow mode.

THE TRACER FUNCTION

PURPOSE

The TRACER function of the ENHANCEMENT is a valuable tool. The TRACER determines which tracks on a disk are used by a particular self booting disk program. The data resulting from the TRACE of a self booting disk is used by the COPY PER TRACER command in the HAPPY BACKUP programs, and by the COMPACT disk command in the HAPPY COMPACTOR program. The COMPACTOR program would not be possible without the TRACER function. Copying disks with the TRACER will usually take less time than copying the whole disk, especially if more than 1 copy is made, since less than the total 40 tracks of the disk are copied.

With disks that are formatted by DOS, the directory may be examined using one of the many disk utility tools to determine which sectors on the disk are used. With a purchased software item which does not have a directory, the software supplier will usually not provide the software user with a list of which tracks on the disk are used. The tracer function of the WARP SPEED SOFTWARE provides the capability to determine the tracks used without a disk directory or published information from the software supplier.

FUNCTION

The TRACER programs the HAPPY ENHANCED disk drive to observe and record the loading process of a self booting disk while that disk is loading. The tracer does NOT examine the program itself to determine the loading sequence. Instead the tracer is a program which runs in an ENHANCED disk drive that sees and remembers each read and write operation that occurred while a program was loading.

If the TRACER is enabled on a HAPPY drive in the drive 1 position that drive will be programed to be in the SLOW mode and will, without the personal computer knowing it, remember the number of each track that was accessed while a program is loaded. If the TRACER is enabled on a HAPPY drive which is not in the drive 1 position (when drive 1 is not a HAPPY ENHANCED drive) that drive will watch the ATARI serial I/O bus and remember the number of each track that the personal computer told drive 1 to access, without drive 1 or the personal computer knowing this. While the TRACER is enabled on a HAPPY drive which is not drive 1 that drive will not respond to the personal computer at all, until the TRACER is unlocked.

The HAPPY drive programed in the TRACER mode will continue to TRACE the loading process of disks until the WARP SPEED SOFTWARE menu program is re-booted, which unlocks the TRACER which was enabled on any HAPPY drive and returns the "TRACKS USED" information to the personal computer for use by the various WARP SPEED SOFTWARE programs.

WHICH DISKS MAKE SENSE TO TRACE

The loading of any self booting disk may be traced. The trace of some self booting programs does not make sense. Programs which do not make sense to trace are those which reaccess the disk drive while the program is being executed. These programs include such items as graphic adventures, which reaccess the disk for each new screen displayed, or games which reaccess the disk after finishing a particular level of play.

Some self booting disks may first boot and display a title screen, and then continue booting. At some point the program may never need to reaccess the disk. This type of program may be successfully traced, provided you have executed it to the point where the disk is no longer accessed.

The most precise determination for the user to select whether or not to use the tracer on a particular self booting disk is as follows: if you can cause the self booting program to access all data on its disk that it will ever need, then a trace of that program execution will be complete and will contain all of the needed "TRACKS USED" information. If it cannot be determined that a self booting disk has accessed all of the tracks it will use, do not use the TRACER.

USING THE TRACER FUNCTION

The TRACER function of the WARP SPEED SOFTWARE is automatic. From the menu of the WARP SPEED SOFTWARE press the number 7 to select the ENABLE TRACER FUNCTION. You must have a HAPPY ENHANCED drive turned on, connected to the personal computer, and selected as any drive from 1 to 4 for the TRACER to be enabled. After pressing 7 the menu program will display the drive number on which the tracer was enabled on, this will be the first ENHANCED drive in the system, starting with drive 1. If there is some problem encountered by the menu program when you request ENABLE TRACER this problem will be reported and the tracer will not be enabled.

Once the menu program reports that the tracer has been enabled you should remove the WARP SPEED SOFTWARE disk from drive one, and turn off the personal computer. Do not turn off the ENHANCED disk drive that the tracer was enabled on. If you do turn off the disk drive that the tracer was enabled on the tracer program setup and enabled in that drive and any tracer data will be lost.

Insert the self booting disk you wish to trace into drive 1 in your system and follow the booting procedure needed for that self booting disk as specified by the documentation for that self booting disk. Some programs may require a cartridge, such as BASIC, to boot correctly. Other programs demand that no cartridge be inserted, or require that you hold down the option button on the newer XL computers which have built in BASIC when turning on the personal computer, so that the built in BASIC is disabled.

You must execute the program you are tracing to the point where you are sure that all the data that program uses on the disk has been accessed at least once for the "TRACKS USED" tracer information to be correct. If you cannot be sure of this the TRACER should not be used with this disk. If this program is a game you may play the game, and even try to beat your old score. This is just for fun and not required. No matter what you do with the program the ENHANCED disk drive that has the tracer enabled will remember all the tracks that the program accessed.

Once the self booting disk you are tracing has completely accessed all tracks it uses you may then turn off the personal computer. Do not turn off the ENHANCED disk drive on which the tracer was enabled. Re-boot the WARP SPEED SOFTWARE disk menu program. If the tracer was enabled on drive 1, drive 1 will return to the FAST MODE automatically. If the tracer was enabled on an ENHANCED drive which was not drive 1 that drive will now respond to the computer as normal.

When a trace has been successfully completed the menu of the WARP SPEED SOFTWARE will show the following: HAVE TRACER DATA = YES. The tracer information may then be displayed by the DISPLAY TRACE function of the menu program, or may be used in the COPY PER TRACER command of the HAPPY BACKUP programs, or the COMPACT program command of the the HAPPY COMPACTOR program. If you turn off the personal computer the tracer's "TRACKS USED" information will be lost, and will not be available the next time you boot the WARP SPEED SOFTWARE disk, unless you re-enable the tracer and trace that self booting program again.

DISPLAY TRACE FUNCTION

When the menu program reports "HAVE TRACER DATA = YES" you may display the tracks used information of the trace of a self booting disk by pressing the number 8 key. The track numbers for the 40 tracks numbered in decimal from 0 to 39 will appear on the video screen and next to each track number will be the word "YES" or the word "NO". A "YES" means that the self booting program just traced did access that track, a "NO" means it didn't. Also displayed at the bottom of the screen is the number of tracks used by the program in decimal, which is the number of tracks which had "YES".

If you write down the name of the program just traced, the tracks which were used, and the total number of tracks used and save this information in your records you will never have to use the tracer function again on this program. The HAPPY BACKUP programs and the HAPPY COMPACTOR program allow you to enter the "TRACKS USED" information directly without tracing the program again. Knowing the quantity of tracks used by a program is useful when you proceed to compact your library with the HAPPY COMPACTOR in an efficient manner; more on this later.

DIAGNOSTIC PROGRAM PURPOSE

The DIAGNOSTIC on the WARP SPEED SOFTWARE disk checks the 810 ENHANCEMENT hardware, in addition to the some of the standard hardware of your 810 disk drive. It does not test all functions and elements of your 810 disk drive, this is performed by qualified service technicians. Please instruct your service technician to use the SLOW IT DOWN program before running any DIAGNOSTIC other than the WARP SPEED SOFTWARE DIAGNOSTIC, since the fast reading may interfere with other diagnostics. The WARP SPEED SOFTWARE DIAGNOSTIC is intended to check the HAPPY 810 ENHANCEMENT hardware and other hardware in your disk drive which is critical to proper ENHANCED disk drive performance.

FUNCTION

The DIAGNOSTIC programs the ENHANCED disk drive to perform certain tests and reports to the user any failures. The diagnostic also includes an RPM test which may be used on an ENHANCED disk drive without running SLOW IT DOWN. The DIAGNOSTIC may be used only with ENHANCED disk drives.

RUNNING THE DIAGNOSTIC

Boot the WARP SPEED SOFTWARE disk as described in these instructions. Be sure that the WARP SPEED SOFTWARE disk is still in drive 1 and press the number 2 to select the diagnostic. The diagnostic will be loaded from the disk and take control of the system. You cannot go back to the menu unless you re-boot the WARP SPEED SOFTWARE disk. As soon as the DIAGNOSTIC finishes loading you will see the DIAGNOSTIC title screen. If you press reset while the diagnostic is running the title screen will again be displayed and the program will restart.

To start the DIAGNOSTIC program enter the drive number (1-4) that you wish to run the diagnostic on. You then have the option of running either a single cycle or a continuous cycle test. Enter 0 to run a single cycle test, or enter 1 to run a continuous cycle test.

If you enter 0 for the single cycle test, and if all of the first tests are passing, you will be instructed to insert and remove any disk from the disk drive for the WRITE PROTECT test. The disk you are using need not be write protected. If you have a special WRITE PROTECT DEFEAT switch on your disk drive be sure that this switch is disabled. Then press start. DO NOT TURN OFF THE DISK DRIVE while doing this test. Failure of this test is not a failure of the ENHANCEMENT.

The continuous cycle test does not perform the WRITE PROTECT test since this requires human interaction. The continuous cycle test is used to allow the drive to run for extended periods (such as all night) to make sure there are no warm up problems.

Please note the following: The DIAGNOSTIC will always stop at the first failure with an error message. After running the diagnostic always turn the disk drive off and then on again before using it for any other purpose. Do not use a disk drive which fails the diagnostic. Have it fixed immediately.

RPM MEASUREMENT

To run the RPM program hold the OPTION button down while you enter the drive number (1-4) on which you want to run the RPM TEST. Then insert a DOS formatted non-copyguarded disk into that drive, and press start. The RPM is continuously updated about every 1/2 second, and has an accuracy of plus or minus 1/2 RPM. The desired value for most disk drive usage is between 285 and 288 RPM. The RPM may be adjusted by a qualified technician while the RPM program is running.

Your drive needs service if the RPM is not in this range, or if the RPM varies by more than plus or minus 1 RPM while the RPM program runs for about 3 minutes. Bad drive RPM is usually never caused by a failure of the HAPPY 810 ENHANCEMENT, since it does not affect the drive spindle motor speed control circuit. Press SYSTEM RESET to stop the RPM program and restart the DIAGNOSTIC program.

HAPPY BACKUP and HAPPY COMPACTOR PROGRAMS

NOTICE

THE COPYRIGHT LAW OF THE UNITED STATES (TITLE 17 UNITED STATES CODE) AND OTHER INTERNATIONAL LAWS GOVERN THE MAKING OF COPIES OF COPYRIGHTED MATERIAL, INCLUDING COMPUTER PROGRAMS. THE PERSON USING THE PRODUCT DESCRIBED IN THIS MANUAL TO MAKE UNAUTHORIZED COPIES, OR COPIES NOT PERMITTED UNDER THE COPYRIGHT LAW, IS LIABLE FOR ANY INFRINGEMENT. BEFORE YOU VIOLATE THE COPYRIGHTS OF OTHERS REMEMBER THAT SOFTWARE SUPPLIERS WORK VERY HARD TO PROVIDE THESE PRODUCTS AND ARE VERY DESERVING OF THE SMALL CHARGE THEY ASK.

PURPOSE

The HAPPY BACKUP PROGRAM (HBP), the MULTI DRIVE PROGRAM (MDP), and the HAPPY COMPACTOR PROGRAM (HCP) are intended for making duplicate backup copies of ATARI executable disks. These programs are all part of the WARP SPEED SOFTWARE programs disk from HAPPY COMPUTERS Inc. These three programs each have a specific purpose which makes their usage different from the other.

LOADING THE HBP HCP or MDP

From the menu of the WARP SPEED SOFTWARE disk press the number which corresponds to the desired program as follows: HAPPY BACKUP - 4, HAPPY COMPACTOR - 5, MULTI DRIVE - 6. The menu program will not allow these programs to be executed if there is no HAPPY drive in the system. The menu program will not allow the MDP to be executed if there are not at least 2 HAPPY drives in the system.

SOURCE and DESTINATION DRIVE SELECTION

The menu program will automatically pick the source and destination drives for these programs, the user may not select these, but may place the HAPPY drives at any of the first four drive select locations. The first encountered HAPPY drive is selected as the source drive. If there is only one HAPPY drive it will also be the destination drive, and in this case the MDP cannot be used. If there are at least 2 HAPPY drives in the system the next HAPPY will be assigned as the destination drive for the HBP and HCP, and will be assigned as the first destination drive for the MDP. If there are more than 2 HAPPY drives in the system they will be assigned by the menu program as destination drives for the MDP program which supports up to 3 simultaneous destination drives.

The menu program reports the source drive number and if this drive is not drive 1, the user will be instructed to place the WARP SPEED SOFTWARE disk into the source drive and press return. It is necessary that these programs load and calibrate from the drive that is used as the source drive. Be sure that you have placed the WARP SPEED SOFTWARE disk in the HAPPY DRIVE NUMBER shown before you press return. This step is not necessary when drive 1 is a HAPPY drive since it will be the source drive and the WARP SPEED SOFTWARE disk should already be inserted into it.

Once the requested program is loaded the main menu for that program will be displayed. You must re-boot the WARP SPEED SOFTWARE disk if you wish to select a different function from the menu. Common features of these three programs are now discussed.

COMMON FEATURES OF HBP, HCP, and MDP

If you press the system reset on the personal computer during execution of these programs all current operations are terminated immediately (prior to completion), all HAPPY drives deactivate (drive motors turn off), and then pressing return will allow the user to return to the main menu. A slight delay may be encountered allowing the disk drives to complete the command they are now executing. Do not press system reset again until the disk drives all deactivate or the personal computer may lockup, requiring the user to re-boot the software.

COMMON FEATURES OF HBP, HCP, and MDP - CONTINUED

A bug in Atari's personal computer operating system in older personal computers causes occasional delays of about 15 seconds in operations which read from or write to the disk drive. If this delay is encountered the best thing to do is wait it out! This is not an error condition.

Some source disks cause noticeable delays while they are being read in. In this case the HAPPY COMPUTERS disk read software is doing its best to try to recover from what may be a loss of data on the disk. It is not possible to distinguish a deliberate bad sector from a weak sector so the software retries for some period of time. The disk drive does not go grind... grind... as it may do when ordinary programs read bad sectors. Instead the system just sits there. Rest assured that the disk drive is hard at work trying to recover as much data as possible within a reasonable period of time.

Unless otherwise noted, all track numbers, track counts, and sector counts reported by these programs are in decimal. This is a change from previous versions of these programs where hexadecimal was used. It is felt that for most people, working in ordinary base 10 is easier.

SPECIAL RECOVERY MENU

The three programs of discussion here all have a common option on the main menu. This is the "S" command key which selects the SPECIAL RECOVERY MENU. Most features on the SPECIAL RECOVERY MENU work the same in all three programs. The functions of the SPECIAL recovery menu and any differences in its use between these three programs are now discussed.

These backup programs are designed to require as little user intervention as possible, while still being efficient in operation. Some specialized features are provided by a secondary display and menu called the SPECIAL RECOVERY MENU. Use of these added features increases the flexibility, and provides additional capability for backing up some disks.

R - RESTORE DEFAULT

When these programs are first loaded some conditions on the SPECIAL RECOVERY MENU are at preset or default conditions. Any changes made to the conditions on this menu remain in effect until the program is reloaded, or you press the "R" key while the SPECIAL RECOVERY MENU is displayed. This is a change from previous versions of our software. Now the default conditions are restored only when you press "R".

The default conditions are as follows:

CURRENT SCAN RETRIES = 04 (shown in hexadecimal)
CURRENT SECTORS NEEDED = 12 (shown in hexadecimal)
FORCED SLOW MODE = NO
SKEW ALIGNMENT = NO
DOS MODE = NO

In the sections that follow an explanation is provided as to what this all means, and how to change from the default values to other values. The "R" option is generally used if you should change your mind about steering away from the default conditions. If you press the "R" option, the above listed default conditions are restored and the programs return to their main menu.

X - RETURN TO MAIN MENU

The "X" command key on the SPECIAL RECOVERY MENU is pressed when you wish to return to the main menu to begin copying. When you press "X" the main copying menu for that program will reappear.

SPECIAL RECOVERY MENU CONTINUED

D - DOS MODE TOGGLE - MDP ONLY

To better facilitate duplication of standard format disks the MDP has a feature which will alarm the user to error conditions when copying. The DOS mode defaults to NO. When the DOS mode is toggled to "YES" by pressing "D" the scan retries are increased to 7F hexadecimal which is 127 decimal, and a special internal flag is set. When DOS mode is YES, it is considered an error condition when any source disk track does not have 18 okay status sectors, and error is reported and copying terminates. This mode is useful when copying DOS formatted disks with the computer system unattended during copying. The "D" key is also useful as a method to easily increase the scan retries. By pressing "D" twice the retries are increased, and the DOS mode is not enabled.

T - SELECT TRACER TRACKS

The T option of the special recovery menu is very powerful! It permits you to specify exactly which tracks you wish to backup from the source disk to the destination disk.

After selection the "T" option from the special recovery menu you will be prompted for a YES/NO/EXIT (Y/N/X) for each of the 40 possible tracks on the source/destination disk. The number of the track is displayed in decimal from 0 to 39 and you may specify "Y" to yes, include the track in the backup, "N" to no, do not include that track in the backup, or "X" to exit, all remaining tracks are set to "NO", and the main copying menu for that program will appear.

In all cases of using the "T" option from the special recovery menu where at least one track is specified as "Y" yes, then the "T" option COPY PER TRACER will now be available on the BACKUP program main menu, or the "C" option COMPACT PROGRAM will now be available on the COMPACTOR program main menu. This happens without actually having enabled the tracer and "TRACED" a disk's loading process.

Selecting the "T" option from the special recovery menu will erase any previous entries into the internal tracer data table so any previously "TRACED" disk information is now lost.

The "T" option on the special recovery menu is always used only when the user knows exactly which tracks are to be backed up. Examples of knowing this are listed below.

The first example is for backing up the software where the numbers of the tracks that are used is provided or known. The WARP SPEED SOFTWARE disk from HAPPY COMPUTERS uses tracks 0 thru 21, and would be difficult to trace since it requires multiple disk loads to get all tracks accessed. Select the "T" option from the SPECIAL RECOVERY menu and answer "Y" for tracks 0 through 21 decimal, and then type "X" when "Y/N/X" is requested for track 22, and use the "T" option for COPY PER TRACER from the main menu. Do not COMPACT the WARP SPEED SOFTWARE... this will not work.

The second example is for backing up a disk on which you have already run the "E" enable tracer option on the main menu and by using the DISPLAY TRACER option and recording the tracks actually reported as needed, enter them later into the "T" option of the special recovery menu for another backup at a later time without actually "TRACING" the loading process again.

The third example would be the "POOR MAN'S APPROACH" to creating your own copyguarded disk of your own software product (rather than by purchasing and using the versatile and easy to use HAPPY CUSTOMIZER PROGRAM). This might be done by copying some copyguarded tracks from an existing copyguarded disk, and placing those tracks of special information on your disk. CAUTION, IT MAY BE A VIOLATION OF COPYRIGHTS TO DUPLICATE SOMEONE ELSE'S COPYGUARD TECHNIQUE, so consult a legal advisor before doing this.

SPECIAL RECOVERY MENU CONTINUED

F - FORCED SLOW MODE TOGGLE

Many of the more recent copyguarding schemes require the use of SLOW mode on the ENHANCED disk drive to execute properly. This does present some inconvenience to the ENHANCED disk drive user even though SLOW IT DOWN is simple and fast to execute.

Now you can instruct the HBP to produce a backup copy which contains special information which will force the disk drive to automatically and temporarily switch to the slow mode while reading that backup copy. Therefore SLOW IT DOWN need not be run to read this disk. If you change disks the drive can automatically switch back into the "FAST" mode with no user intervention.

The "SLOW" mode invoked by creating a backup in the forced slow mode is not exactly the same as running SLOW IT DOWN. The slow mode invoked automatically by disks created in the forced slow mode does not lock out the enhanced drive's programability and the ENHANCEMENT is therefore detectable by some of those nasty software suppliers. They are just making their own lives more difficult since they waste time and money writing code to detect the ENHANCEMENT, when after running the SLOW IT DOWN program, the ENHANCED drive is indistinguishable from the standard 810.

Never the less, the forced slow mode is very useful for the intended purpose. As of this writing, there are no known software items which included code specifically to detect a "NOT SLOWED DOWN" HAPPY ENHANCED disk drive; but in examining other non standard hardware configurations, this type of detection code is found, so it might be suspected that such code might be written for HAPPY COMPUTING'S products. In any case, if a disk backup produced in the forced slow mode does not execute correctly, you can always run the "SLOW IT DOWN" program to get around this problem.

Pressing "F" from the special recovery menu will toggle the forced slow mode from YES to NO and visa versa. If the display shows NO, then a forced slow mode disk will not be created. If the display shows YES, then the next backup copy produced will be in the forced slow mode. Forced slow mode with the COMPACTOR only has an effect with the destination disk for the "X" extract program command. For the forced slow mode to work with tracer copying, tracks 0, 1, and 2 must be written. Make sure the tracer does not skip over one of these tracks, by reselecting the tracer tracks if necessary.

SECTORS NEEDED AND RETRIES

A brief explanation of how the source disk reading process works will help. Each track on the source disk is first scanned to determine how many sectors are present, and which sector numbers these are. This phase is called SCAN ANALYSIS. Once the quantity of sectors and their numbers are determined the data from the sectors is actually read. Therefore, source disk reading is actually done in 2 operations, one called SCAN ANALYSIS, the other called DATA READING. The sectors needed and retries affect only the SCAN ANALYSIS portion. The scan analysis requires that all the sectors be seen in just one revolution of the disk, so that the correct ordering of sectors can be duplicated. The DATA READ operation is already written to allow many retries if a soft error occurs during data read.

Disks which are weakly written or are written out of alignment with respect to your source drive may cause SOFT ERRORS during reading. SOFT ERRORS are disk read errors which may not occur when the disk again passes the read head and is read again. If a soft error occurs while the SCAN ANALYSIS is being done it is possible that one sector may be missed entirely. To help avoid missing a sector during SCAN ANALYSIS there are certain parameters that cause the SCAN ANALYSIS to re-read the track, trying to get more sectors. After each SCAN ANALYSIS a comparison is made to see if there are at least as many sectors as specified by the "SECTORS NEEDED = XX" parameter. If there are the program continues with DATA READING. If there are not enough sectors the program will retry the SCAN ANALYSIS. The number of times the program will retry is specified by the "SCAN RETRIES = XX" parameter. By changing these parameters you might be able to copy a weakly written or out of alignment source disk. The "+", "-", "*", and "/" keys on the special recovery menu increase or decrease these parameters as indicated. By increasing the retries substantially you may be able to copy an otherwise uncopiable disk.

SPECIAL RECOVERY MENU CONTINUED

SKEW ALIGNMENT MODE - HBP and HCP, not in MDP

Skew alignment is a special mode of copying where the position of sectors on one track has an important relationship to the position of sector on another track. SKEW ALIGNMENT = YES is selected by pressing the "A" key on the SPECIAL RECOVERY MENU. When selected, the skew alignment mode will increase the time required to backup a disk. Skew aligned copying is not necessary with most disks. It is for these reasons that the skew alignment option defaults to NO.

It is noted here that the software vendors (companies) listed below may be legal, and or registered tradenames or trademarks. HAPPY COMPUTERS wishes to congratulate these companies for the fine products they produce. HAPPY COMPUTERS does not represent that the backing-up of software is legal, consult your own legal advisor for the current legal position on that issue. Therefore, this information is provided for educational purposes only. Software sold by the following companies may require the use of the skew alignment mode to produce an executable backup copy. These companies include ELECTRONIC ARTS, SYNAPSE, and PARADISE SOFTWARE, other companies may also require skew alignment mode.

PROBLEMS WITH SKEW ALIGNED COPYING

Accurate skew alignment performed by the HAPPY COMPUTERS software depends on drive RPM being fairly steady for several revolutions (wow and flutter small). The RPM measurement may then be mathematically factored out from the desired alignment figure, which allows the source and destination drives to be turning at different RPMs while still accurately duplicating the alignment. The RPM of both drives should be within range of that specified in the DIAGNOSTIC documentation.

Constant RPM, even for a single revolution, seems to be a problem in some older 810 disk drives. In our opinion, the spindle motor speed regulation circuit as well as the power supply to this circuit in older 810 disk drives seems to have insufficient operational tolerance. Atari realized this problem and updated the 810 to the so called ANALOG, or GRASS VALLEY configuration, which in the opinion of HAPPY COMPUTERS, greatly improved the reliability and operational performance tolerance of the power supply, spindle motor speed control, and read/write amplifier circuitry. This ANALOG upgrade may be available at Atari service centers, or you may look into the ANALOG upgrade offering from HAPPY COMPUTERS, included with this manual (if still available). Other factors which affect the wow and flutter of the disk RPM include the wear and state of lubrication on the following parts: drive motor, drive belt, spindle bearings, disk cone bearing, and the destination diskette itself.

Since the HAPPY COMPUTERS skew alignment software does not rely on the disk index hole for accurate skew alignment there are other disk drive defects which can affect the accuracy of skew alignment. These include the stepper motor and driver circuitry, the read/write head and the entire read and write analog circuitry.

In summary, accurate skew alignment results only when the entire disk drive is functioning properly. HAPPY COMPUTERS experience with this problem shows that the majority of these problems can be cured by having the drive regularly serviced, including checking the variation in current through the spindle motor, cleaning, and proper lubrication. Also, installation of the ANALOG upgrade is a must. Almost never will the circuitry on the HAPPY ENHANCEMENT board have any bearing on these types of defects. It is unfair to blame HAPPY COMPUTERS for these problems. If we find these problems to be of significant proportion, then we may develop a diagnostic, but this is not our responsibility.

HAPPY COMPUTERS' tests of skew aligned copying using various ANALOG equipped 810 disk drives in good working order as both source and destination drives show no problem in backing up and compacting even the most demanding skew aligned disks with our current software. One problem easily remedied is to first warm up the destination drive by doing some un-needed copying or non skew aligned copying so that the motors and circuitry reach a stable operating temperature. If you have only one drive equipped with ANALOG circuitry in good operating condition, it is recommended that this drive be used for both source and destination drive when copying skew aligned disks.

OTHER COMMON FEATURES OF HBP, HCP, and MDP

These programs will always tell the user what is now being done, and what the user is to do next. These programs always report successful completion, or report error conditions if completion is not successful. The message "DONE" will appear when a particular copying operation is finished. There is more to do unless you see "DONE". Each time a disk insertion is needed, read the message carefully as the disk drive number and which disk to insert is always shown.

As these programs read from the source disk the actual physical track number being read is reported. Completely unreadable tracks mean that no data is available to be read from that track. It is possible to read thin air and the indication will be unreadable format. When standard software attempts a read of an unreadable format track, a disk error will result and this may be part of the copyguard. Tracks with some data sectors will show the number of okay status sectors. If you are copying a standard format disk, formatted by DOS, you should always get 18 okay status sectors on each track, otherwise there is a bad sector on the source disk. When reading copyguarded disks a display of 18 okay status sectors does not necessarily mean there is no copyguard. These programs are not tools for examining the copyguards.

The destination disk does not need to be formatted. Any track written to on the destination disk is first erased and then overwritten with the format and data that was present on the source disk, and verified. If you accidentally have a write protect tab on a destination disk you will get an ERROR DURING WRITING RETRY (Y/N), remove the write protect tab and press Y to continue copying. This error may also occur if there is some problem with the destination disk or destination disk drive.

If you are using 2 HAPPY ENHANCED drives as source and destination, copying proceeds from start to finish without interruption (unless there is an error condition). If you are using 1 HAPPY drive (not with MDP) the program will first read in and fill memory with as much data as will fit in the personal computer memory, instruct you to insert the destination disk, write that data from memory to the destination disk, and continue this cycle until all desired tracks are copied. With the HBP you have the option, each time memory is filled with a group of tracks from the source disk, to write this data to as many destination disks as is desired. You must insert each destination disk after each time the source disk is read to ensure that all destination disks contain all the data. To do this answer "Y" to the question "ANOTHER COPY (Y/N)", answer "N" to this question if you are only making 1 copy. Copying is NOT finished when this message appears, copying is finished when the program says: "DONE".

SPECIFIC PURPOSE AND USAGE HAPPY BACKUP

The HBP is, in our opinion, the most powerful backup program for use in backing up Atari personal computer software. The HBP allows the user to backup important software and use the backups while saving the original master. The more the backup program is used as a piracy device, the harder software companies will try to get around it, costing you and them more money, but making HAPPY COMPUTERS more money in revisions, since there is no lock that one mortal can make that another mortal cannot create the key to, unless the supernatural is employed. Please respect the copyrights of others.

SPECIFIC PURPOSE AND USAGE OF MULTI DRIVE

The MDP makes efficient usage of the processing power of ENHANCED disk drives. Reading from the source disk is time overlapped with writing to the destination disk(s). In addition the MDP will support up to three ENHANCED destination drives, making up to three copies of the source disk, in just slightly more than the time required to make one copy. Any ENHANCED disk drive recognized by the menu program after the source drive will automatically be used as a destination drive. In order to remain efficient, the MDP does not support some of the newest copy protection methods. The MDP supports copying of custom format disks created with the HAPPY CUSTOMIZER PROGRAM (sold separately).

DISK COPYING WITH HBP and MDP

The main menu option "C" will copy all 40 tracks from the source disk to the destination disk. The main menu option "T" will appear when the tracer data is available and will copy only those tracks specified by the "TRACKS USED" tracer information.

SPECIFIC PURPOSE HAPPY COMPACTOR

The HAPPY COMPACTOR PROGRAM (HCP) is intended for use in reducing the number of disks required to BACKUP your disk library, and allows more convenient access to programs.

The HCP combines self booting ATARI disks which normally contain one program per disk, into one disk with many self booting programs. Most self booting disks use less than the full 40 tracks available on a disk, so ordinarily the rest of the space on the disk is wasted. The HCP allows the use of all tracks on a disk to store many self booting programs. Not all self booting programs can, or should be compacted. Normally most programs which meet the criterion explained in the section on ENABLE TRACER can be COMPACTED. The HCP does not compact programs in the sense of making them smaller, rather it compacts the the size of your backup library.

FUNCTION

During COMPACTION, the HCP makes a track by track duplicate of the source disk, while placing a particular track's information from the source disk on a different track (usually) on the destination 'COMPACTED' disk. This is called TRACK RE-MAPPING. The destination disk tracks that are written are formatted, written, and verified with the same data present on the source disk. It is not necessary to format a destination disk prior to using the HCP. However, it is necessary that the destination COMPACTED disk be initialized with the HCP. All tracks written to the destination disk are completely replaced with that track's contents on the source disk. All analysis, reading, formatting, writing, remapping, and verification are performed automatically, and efficiently with no special user intervention required.

The HCP is actually a miniature operating system. Self booting programs on a compacted disk are referred to in a manner similar to other FILES. The HCP provides for creation (compact), copying (extract and move), killing (delete), and renaming of these files, as well as initial disk initialization.

The HCP creates a COMPACTED FORMAT disk which includes a self booting menu selection program and the actual compacted files. Access to these files is possible only with either the self booting COMPACTED disk menu, which allows only program execution, or the HCP itself. THE FILES ARE NOT DOS FILES. The resultant compacted disk must be booted on an ENHANCED disk drive in the drive 1 position, and that drive must not be in the slow mode. The self booting compacted disk automatically executes all files in the SLOW mode, so use of SLOW IT DOWN, and FORCED SLOW MODE is not necessary when compacting or moving compacted files. FORCED SLOW MODE may be used when extracting a file back to its original form.

COMPACTED FILE NAMES

COMPACTED programs are identified by a name typed in by the user at initial COMPACT or MOVE time. These names may be up to 16 characters long and include any characters including embedded spaces. While typing in COMPACTED program names use only the BACKSPACE key to erase errors, do not use the CONTROL ARROW keys.

INITIALIZE COMPACTED DISK

This main menu command places the self booting control program for a compacted disk on track zero of the destination disk, and clears the compacted disk directory. The destination disk track zero is formatted, written, and verified with this information, any information previously on track zero of this disk is erased. During initialization a code is placed on the disk which is the frame counter locations 18-20 from the personal computer, which may be treated as a random number. This special code is compared during execution of the "C", "X", and "M" commands to ensure that the correct compacted source or compacted destination disk has been inserted when requested. Otherwise this code is invisible to the user. If you get a message telling you "WRONG COMPACTED DISK INSERTED" then remove that disk and put the one that should be used into the disk drive shown.

PROGRAM COMPACTING

Only self booting programs which can be completely traced can be compacted. See the ENABLE TRACER description in the WARP SPEED SOFTWARE menu program. A compacted disk is first created using the "I" initialize compacted disk command on the COMPACTOR main menu, only disks initialized by the COMPACTOR will be accepted when the user is told to insert a COMPACTED disk.

To compact a program first trace the program or enter the tracks used information directly using the special recovery menu "T" option. The "C" COMPACT PROGRAM command will then be available on the COMPACTOR program main menu. The "C" command will instruct you to insert source disk and destination compacted disk as needed. When copying is finished the COMPACTOR will ask for the program name. Once the name is entered the compacted disk's directories will be updated and the program will then be on the disk. If COMPACTION is interrupted by an error or by stopping the program, the compacted program will not take up space on the disk.

EXTRACT and MOVE PROGRAM

Program extraction with the "X" command reverses the compaction process, re-creating a copy of the original source disk that is not compacted. The source disk is a compacted disk and the destination disk is not compacted. Forced slow may have a meaning only in this case with the compactor. COMPACTED programs may be moved from one compacted disk to another with the "M" command. In this case both the source disk and the destination disk are compacted.

COMPACTED DISK IDENTIFICATION

Internal to the COMPACTOR program is the generation and checking of compacted disk id numbers. This id number is a random number placed on the compacted disk during initialization. When the user is instructed to insert a compacted disk into the source or destination drive during the execution of the "C", "X", or "M" command, the id number is checked to be sure that the correct disk is inserted.

OTHER COMPACTOR COMMANDS

The other commands on the COMPACTOR menu not yet mentioned do a straight forward file management function. These commands include the following: D) DISPLAY DIRECTORY, R) RENAME COMPACTED PROGRAM, and K) KILL COMPACTED FILE.

GETTING ORGANIZED

To efficiently reduce the number of disks required to backup your library you should keep careful records of how many tracks are used by each self booting program to be compacted by using the ENABLE TRACER and DISPLAY TRACER in the WARP SPEED SOFTWARE menu program. At the same time you may write down the tracks used info so that you don't have to trace the disk again when you are actually ready to compact it. Out of the 40 tracks on a disk, 39 are available to hold compacted programs since one track is used for the compacted disk self booting program and directories. Try to optimize your disk usage by using as many of the 39 tracks available.

EXECUTING COMPACTED DISKS

The compacted disk boots in an ENHANCED disk drive in the drive 1 position. If the compacted program to be executed requires a cartridge or other special hardware that hardware must be connected. When the compacted disk is first booted the directory of compacted programs is displayed. Press the number corresponding to the program to be executed and the program will load and execute. Turning off and on the personal computer will cause the compacted disk directory to reappear. If the compacted disk is removed from the drive, and the write protect detect circuitry is working correctly, the track remapping will be disabled. This is useful with such programs as text editors. The editor may be on a mapped compacted disk and the data disk will not be mapped. Once the compacted disk is removed from the disk drive, it should not be re-inserted without first turning off the power on the personal computer or the wrong data may be read from the disk.